**Amendments to the Claims:**

Please cancel claim 37 without prejudice or disclaimer. Please amend claims 24, 37 and 41 as shown below.

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-23. (Cancelled)

Claim 24. (Currently Amended) A system for determining the instantaneous amplitude (a) and phase ($\phi$) of an analog sinusoidal signal comprising:

a vibratory accelerometer which produces said analog sinusoidal signal ~~output~~ in response to the measurement of a parameter;

an analog-to-digital converter which receives said analog sinusoidal signal from the ~~sensor~~ vibratory accelerometer and converts said analog sinusoidal signal to a digital sinusoidal signal to form the in-phase component (I) of said sinusoidal signal;

a Hilbert transformer approximation device which receives said digital sinusoidal signal and produces the quadrature component (Q) of said digital sinusoidal signal by introducing a phase shift to said digital sinusoidal signal; and

a Coordinate Rotation Digital Computer (CORDIC) comprising:

an amplitude computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous amplitude (a) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

a phase computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous phase ($\phi$) of said digital sinusoidal signal by

processing said in-phase (I) and quadrature (Q) components according to the equation $\phi = \tan^{-1}(Q/I)$.

Claim 25. (Original) The system of claim 24 wherein said Hilbert transformer approximation device further introduces a predetermined delay into said quadrature component (Q).

Claim 26. (Original) The system of claim 25 further comprising a delay device which introduces said predetermined delay into said in-phase component (I).

Claims 27-35. (Cancelled)

Claim 36. (Previously Presented) A method of determining the amplitude (a) and phase ($\phi$) of an analog sinusoidal signal comprising:

A. measuring a parameter of an object with a vibratory accelerometer;

B. generating said analog sinusoidal signal representative of said parameter;

C. digitizing said analog sinusoidal signal to produce a digital sinusoidal signal;

D. filtering said digital sinusoidal signal to attenuate out-of-band noise in said digital sinusoidal signal;

E. introducing a delay into said digital sinusoidal signal to produce an in-phase signal (I) associated with said digital sinusoidal signal;

F. performing a Hilbert transform approximation of said digital sinusoidal signal to introduce a phase shift plus the delay into said digital sinusoidal signal, thereby producing a quadrature signal (Q) associated with said digital sinusoidal signal;

G. processing, with a Coordinate Rotation Digital Computer (CORDIC), said in-phase (I) and quadrature (Q) signals to compute said amplitude (a) of said digital sinusoidal signal according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

H. processing, with said CORDIC, said in-phase (I) and quadrature (Q) signals to compute said phase ($\phi$) of said digital sinusoidal signal according to the equation $\phi = \tan^{-1}(Q/I)$.

Claims 37-40. (Canceled)

Claim 41. (Currently Amended) A system for determining an instantaneous amplitude (a) and phase ($\phi$) of an output analog sinusoidal signal comprising:

a vibratory accelerometer which produces said output analog sinusoidal signal characterized by an instantaneous phase and amplitude in response to the measurement of a parameter;

an analog-to-digital converter which receives said output analog sinusoidal signal from the vibratory ~~sensor~~ accelerometer and converts said output analog sinusoidal signal to a digital sinusoidal signal to form the in-phase component (I) of said sinusoidal signal;

a Hilbert transformer approximation device which receives said digital sinusoidal signal and produces the quadrature component (Q) of said digital sinusoidal signal by introducing a phase shift to said digital sinusoidal signal; and

a Coordinate Rotation Digital Computer (CORDIC) comprising:

an amplitude computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous amplitude (a) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

a phase computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous phase ($\phi$) of said digital sinusoidal signal by

processing said in-phase (I) and quadrature (Q) components according to the equation $\phi = \tan^{-1}(Q/I)$.

Claim 42. (Previously Presented) A method of determining the amplitude (a) and phase ($\phi$) of an analog sinusoidal signal comprising:

A. measuring a parameter of an object with a vibratory accelerometer;

B. generating an output analog sinusoidal signal characterized by the instantaneous phase and amplitude representative of said parameter;

C. digitizing said output analog sinusoidal signal to produce a digital sinusoidal signal;

D. filtering said digital sinusoidal signal to attenuate out-of-band noise in said digital sinusoidal signal;

E. introducing a delay into said digital sinusoidal signal to produce an in-phase signal (I) associated with said digital sinusoidal signal;

F. performing a Hilbert transform approximation of said digital sinusoidal signal to introduce a phase shift plus the delay into said digital sinusoidal signal, thereby producing a quadrature signal (Q) associated with said digital sinusoidal signal;

G. processing, with a Coordinate Rotation Digital Computer (CORDIC), said in-phase (I) and quadrature (Q) signals to compute said amplitude (a) of said digital sinusoidal signal by applying the equation $a = \sqrt{(Q^2 + I^2)}$; and

H. processing said in-phase (I) and quadrature (Q) signals to compute said phase ($\phi$) of said digital sinusoidal signal by applying the equation $\phi = \tan^{-1}(Q/I)$.